WHAT IS CLAIMED IS:

1. A method of communications in a network using a protocol of pulse transmissions between one master station and one or more user stations, wherein the method comprises the following steps:

synchronizing pulse response of the master station received by the user stations;

acquiring the pulse responses from the user stations received by the master station;

sending pulses close to each other from the master station to the different user stations, and from the different users to the master station; and

equalizing the pulses at reception for each user station and for the master station.

2. The method according to claim 1, comprising the step of interlacing of signals sent from the user stations to the master station.

3. The method according to claim 1, comprising the step of interlacing of the signals sent from the master station to the user stations.

4. The method according to claim 1, wherein the synchronization step comprises a step for measuring the distance between the central station and a user making it possible to determine the time lag to be applied during transmission from a user station to the master station.

5. The method according to claim 1, wherein the equalization step comprises a step of estimation of the parameters of the propagation channel and a step of equalization with sampling at the chip rate, the rate of the associated pulses.

6. The method according to claim 5, comprising a step for the estimation of the parameters of the propagation channel comprising the following steps:

a station sends a known sequence of N symbols $\mathbf{s}_{ref} = \left[s_{ref}(1), \ldots, s_{ref}(N) \right]^{T}$ and the signal received by a second station after sampling is expressed as:

$$\mathbf{y} = \mathbf{HCs}_{ref}$$

with $\mathbf{y} = [y(1),\ldots,y(M)]^T$ where $\mathbf{C}$ is the encoding matrix of the temporal spread code used by the different users and $\mathbf{H}$ is the matrix formed by the values of the pulse response $h(t)$ of the channel, sampled at the rate T_c.

$\mathbf{y}$ is rewritten in the form $\mathbf{y} = \mathbf{Sh}$ where $\mathbf{S}$ is a matrix whose elements are known and $\mathbf{h} = [h(1),\ldots,h(L)]^T$ with $h(n) = h(t)\big|_{t=nT_c}$

$\mathbf{h}$ is estimated with $\mathbf{S}$ and $\mathbf{y}$ being known, in using a method of equalization.

7. The method according to claim 5, wherein the equalization of the downlink channel uses a signal received by the user station and coming from the master station, the signal being expressed in the form:

$$\mathbf{y}_{u,PA} = \mathbf{H}_{u,PA}\mathbf{s}$$

with $\mathbf{s} = \sum_{p=1}^{N_u} \mathbf{C}_p \mathbf{s}_p$ where $\mathbf{H}_{u,PA}$ is the matrix of convolution of the propagation channel between the master station and the user u, $\mathbf{C}_p$ and $\mathbf{s}_p$ are respectively the encoding matrix of the spread code and the sequence of symbols of the user p.

8. The method according to claim 5, wherein the step of equalization of the uplink channel uses a signal received by the master station and coming from a user, the signal having the form:

$$\mathbf{y}_{PA,u} = \mathbf{H}_{PA,u}\mathbf{C}_u \mathbf{s}_u$$

the composite signal received at the master station and coming from all the users is then written as:

$$\mathbf{y}_{PA} = \sum_{p=1}^{N_u} \mathbf{H}_{PA,p}\mathbf{C}_p \mathbf{s}_p$$

the matrices $\mathbf{H}_{PA,u}$ are determined by means of the estimation of the channels of the uplink channels, the received signal is rewritten in the form

$$\mathbf{y}_{PA} = \mathbf{H}_{PA}\mathbf{s}$$

with $\mathbf{H}_{PA} = [\mathbf{H}_{PA,1}\mathbf{C}_1,\ldots,\mathbf{H}_{PA,N_u}\mathbf{C}_{N_u}]$ and $\mathbf{s} = [\mathbf{s}_1^T,\ldots,\mathbf{s}_{N_u}^T]^T$.

9.   The method according to claim 1 wherein, during a downlink channel communication, at least the first pulse train is reserved to keep the synchronization with the master station.

10.   The method according to claim 1 wherein the interlacing step uses an orthogonal code.

11.   A system of communications in a network using a protocol of transmission by pulses between one master station and one or more user stations, wherein the master station and the user stations are equipped with processors adapted to:

   synchronizing the pulse response from the master station received by the user stations;

   acquiring the pulse responses from the user stations received by the master station;

   sending pulses close to each other from the master station to the different user stations, and from the different users to the master station; and

   equalizing the pulses at reception for each user station and for the master station.

12.   The use of the method according to claim 1 in a centralized network.

13.   The use of the method according to claims 1 in a network carrying a UWB transmission layer.

14.   The use of the method according to claim 11, wherein the processors are adapted to interlace signals sent from the user stations to the master station.

15.   The use of the method according to claim 11, wherein the processors are adapted to interlace signals sent from the master staion to the user stations.

16.   The use of the method according to claim 11, wherein the processors are adapted to measure the distance between the central station and a user

making it possible to determine the time lag to be applied during transmission from a user station to the master station.

17.   The use of the method of claim 11, wherein the processors are adapted to estimate the parameters of the propagation channel and a step of equalization with sampling at the chip rate, the rate of the associated pulses.

18.   The use of the method of claim 11, wherein the processors are adapted to estimate the parameters of the propagation channel comprising the following steps:

a station sends a known sequence of N symbols $s_{ref} = [s_{ref}(1),\ldots,s_{ref}(N)]^T$ and the signal received by a second station after sampling is expressed as:

$$y = HCs_{ref}$$

with $y = [y(1),\ldots,y(M)]^T$ where C is the encoding matrix of the temporal spread code used by the different users and H is the matrix formed by the values of the pulse response $h(t)$ of the channel, sampled at the rate T_c.

y is rewritten in the form $y = Sh$ where S is a matrix whose elements are known and $h = [h(1),\ldots,h(L)]^T$ with $h(n) = h(t)|_{t=nT_c}$

h is estimated with S and y being known, in using a method of equalization.

19.   The use of the method of claim 17, wherein the processors are adapted to estimate the equalization of the downlink channel uses of a signal received by the user station and coming from the master station, the signal being expressed in the form:

$$y_{u,PA} = H_{u,PA}s$$

with $s = \sum_{p=1}^{N_u} C_p s_p$ where $H_{u,PA}$ is the matrix of convolution of the propagation channel between the master station and the user u, C_p and s_p are respectively the encoding matrix of the spread code and the sequence of symbols of the user p.